

Claims

1. An isolated or substantially pure form of a nucleic acid molecule encoding a human 5-HT_{4(h)} receptor.
2. The nucleic acid molecule of claim 1 encoding a human 5-HT_{4(h)} receptor comprising the amino acid sequence illustrated in Figure 1b or encoding a functional equivalent, derivative or bioprecursor of said receptor.
3. A nucleic acid molecule according to claim 1 or 2 which is a DNA molecule.
4. A nucleic acid molecule according to claim 3, wherein said DNA molecule is a cDNA molecule.
5. A nucleic acid molecule according to any of claims 2 to 4 comprising the sequence illustrated in Figure 1b.
6. A nucleic acid molecule capable of hybridising to the molecule of any of claims 1 to 5 or the complementary sequences thereto under conditions of high stringency.
7. A human 5-HT_{4(h)} receptor encoded by the nucleic acid molecule according to any of claims 1 to 5.
8. A DNA expression vector comprising a nucleic acid

molecule according to any of claims 3 to 5.

9. A host cell transformed or transfected with the vector of claim 8.
10. A host cell according to claim 9, which cell is a mammalian cell.
11. A host cell according to claim 10, which mammalian cell is a COS-7 cell.
12. A transgenic cell, tissue or organism comprising a transgene capable of expressing a human 5-HT_{4(h)} receptor protein comprising the amino acid sequence of Figure 1b or an amino acid sequence of a functional equivalent, derivative or bioprecursor of said receptor.
13. A transgenic cell, tissue or organism according to claim 12 wherein said transgene comprises a nucleic acid molecule according to any of claims 1 to 5.
14. A human 5-HT_{4(h)} receptor protein or a functional equivalent, derivative or bioprecursor thereof, expressed by the cell according to any of claims 9 to 11 or the cell tissue or organism according to claim 12.
15. A HEK 293 or COS-7 5-HT_{4(h)} cell line transfected with the expression vector of claim 8.

16. An antisense molecule comprising a nucleic acid molecule which is capable of hybridising to the nucleic acid of any of claims 1 to 5 under conditions of high stringency.
17. A pharmaceutical composition comprising a molecule according to claim 16 together with a pharmaceutically acceptable carrier, diluent or excipient therefor.
18. An antisense molecule according to claim 13 for use as a medicament.
19. A purified or isolated human 5-HT_{4(h)} receptor protein comprising the amino acid sequence according to Figure 1b or the amino acid sequence of a functional equivalent, derivative, fragment or bioprecursor of said sequence.
20. A pharmaceutical composition comprising a molecule according to any of claims 1 to 5 together with a pharmaceutically acceptable carrier, diluent or excipient therefor.
21. An antagonist or an agonist of a ligand of the human 5-HT_{4(h)} receptor protein according to any of claims 14 or 19.
22. A pharmaceutical composition comprising an antagonist or an agonist according to claim 21

together with a pharmaceutically acceptable carrier, diluent or excipient therefor.

23. A method of determining whether a compound is an agonist or an antagonist of a ligand of a human 5-HT_{4(h)} receptor, which method comprises contacting a cell according to any of claims 7 to 10 expressing said receptor protein with said compound in the presence of said ligand and monitoring cAMP formation in said cell.
24. A method according to claim 23 wherein said cell is a human cell.
25. A method of determining whether a compound binds to a human 5-HT_{4(h)} receptor which method comprises contacting a cell, according to any of claims 9 to 12 or a membrane preparation comprising said receptor, with said compound and establishing the binding affinity of said compound for said receptor.
26. A compound identifiable as an agonist or antagonist according to the method of claim 24 or 25.
27. A compound according to claim 26 for use as a medicament.
28. Use of a compound identifiable according to the method of claim 26 or an antisense molecule

according to claim 16 in the manufacture of a medicament for the treatment of any of heartburn, reflux, esophagitis, Barrett's esophagus, esophageal cancer, achalasia, esophageal stenosis, esophageal spasms, esophageal hiatal hernia or other esophageal motility disorders, oesophageal irritation, such as asthma, bronchospasms, aspiration and its consequences (bronchitis, (broncho)pneumonia, bronchiectasia) and other diseases of the lower oesophageal sphincter, or achalasia; oesophageal stenosis (due to systemic sclerosis, tumours, burns, or the like) or compression, oesophageal spasms or other oesophageal motility disorders, asthma, irritable bowel syndrome, bronchospasms and other airway disorders possibly connected with oesophageal irritation aspiration and its consequence (bronchitis, (broncho)pneumonia, bronchiectasia); (hiatus) hernia; denervation of the oesophagus (e.g. after certain types of trauma or surgery), disturbances in oesophageal innervation.

29. A pharmaceutical composition comprising a compound according to claim 27 together with a pharmaceutically acceptable carrier diluent or excipient therefor.
30. An antibody specific for a human 5-HT_{4(h)} receptor according to claim 7 or 19.

31. A kit for determining whether a compound is an agonist or an antagonist of a 5-HT_{4(h)} ligand, which kit comprises a cell according to any of claims 9 to 12, means for contacting said compound and said ligand with said cell and means for measuring cAMP formation is said cell.
32. A kit according to claim 31 wherein said cell is a COS-7 cell.
33. A pharmaceutical composition incorporating the nucleic acid sequence according to any of claims 1 to 5, or the antibody according to claim 30, together with a pharmaceutically acceptable carrier, diluent or excipient therefor.
34. A method of identifying a ligand for 5-HT_{4(h)} receptor, which method comprises contacting a cell expressing said receptor with said compound to be tested and monitoring the level of any 5-HT_{4(h)} mediated functional or biological response.